

Applicant(s): Sung-bae Park, *et al.*
Serial No.: 09/924,787

REMARKS

Claims 1 and 4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Prior Art Drawings in view of Geissler, *et al.* (U.S. Patent Number 6,245,600) and Hsu, *et al.* (U.S. Patent Number 5,804,858). Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Prior Art Drawings in view of Geissler, *et al.*, Hsu, *et al.* and Adan, *et al.* (U.S. Patent Number 5,841,170). Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Prior Art Drawings in view of Geissler, *et al.*, Hsu, *et al.* and Hashimoto, *et al.* (U.S. Patent No. 5,475,257). Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Prior Art Drawings in view of Geissler, *et al.*, Hsu, *et al.* and Lynch, *et al.* (U.S. Patent No. 4,646,123). Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Prior Art Drawings in view of Geissler, *et al.*, Hsu, *et al.*, Lynch, *et al.* and Abiko, *et al.* (U. S. Patent number 6,051,472). In view of the amendments to the claims and the following remarks, the rejections are respectfully traversed, and reconsideration of the rejections is requested.

The applicants' invention is directed to a silicon-on-insulator (SOI) MOSFET. The MOSFET includes a substrate, a buried oxide layer formed on the substrate, a body formed on the buried oxide layer, wherein the body is an active region of a transistor. A gate oxide layer is formed on the body, and a gate is formed on a gate oxide layer. An isolation region is formed adjacent to and at least partially surrounding the body. A body contact supplies power to the body. The body contact is at least partially surrounded by a field oxide region which is formed in the isolation region. The body contact is formed by forming a trench that perforates the isolation region, the field oxide region, the body and the buried oxide layer and filling the trench with a conductive material so that the body is electrically connected to the semiconductor substrate. The conductive material filling the trench can include a silicon epitaxial layer.

The claims have been amended to more clearly specify the structure of the invention. Specifically, the claims are amended to specify that the conductive material filling the trench

Applicant(s): Sung-bae Park, *et al.*
Serial No.: 09/924,787

includes a silicon epitaxial layer. None of the prior art references, taken alone or in combination, teaches or suggests the features of the invention set forth in the amended claims.

The applicants' prior art drawings do not teach or suggest the body contact of the amended claims. They also do not teach or suggest the field oxide region formed in an isolation region and at least partially surrounding the body contact. They also do not teach or suggest a trench perforating an isolation region, a field oxide region, a body and a buried oxide layer, wherein the trench is filled with a conductive material which includes a silicon epitaxial layer, as now set forth in the amended claims.

The Geissler *et al.* patent discloses various structures having charge dissipation paths for eliminating electrostatic discharge in SOI wafers. The various disclosed charge dissipation paths 18 are not body contacts for supplying power to a SOI structure body. The applicants' claims specifically recite a body contact supplying power to the body and being formed as a trench perforating an isolation region, a field oxide region, the body and a buried oxide layer. The Geissler *et al.* charge dissipation paths are not body contacts. Furthermore, Geissler *et al.* do not teach or suggest the field oxide region formed in the isolation region and at least partially surrounding the body contact, as now set forth in the amended claims. Also, Geissler *et al.* do not teach or suggest the trench being filled with a conductive material which includes a silicon epitaxial layer.

Hsu, *et al.* discloses a body node contact in a SOI device. However, Hsu, *et al.* do not teach or suggest a body contact trench filled with a conductive material which includes a silicon epitaxial layer.

None of the Applicant's Prior Art Drawings, the Geissler *et al.* patent and the Hsu, *et al.* patent teaches or suggests the body contact of the invention in which a trench is filled with a conductive material that includes a silicon epitaxial layer, as set forth in the amended claims. Accordingly, there is no combination of the references which would provide such teaching or suggestion. Therefore, it is believed that the amended claims are allowable over the cited references, and reconsideration of the rejections of claims 1 and 4 under 35 U.S.C. § 103(a)

Applicant(s): Sung-bae Park, *et al.*
Serial No.: 09/924,787

based on the Applicant's Prior Art Drawings, Geissler *et al.* and Hsu, *et al.* is respectfully requested.

With regard to claim 2, Adan, *et al.* also fail to teach or suggest the body contact set forth in the amended claims. Adan, *et al.* also fail to teach or suggest the field oxide region set forth in the amended claims. Adan, *et al.* also fail to teach or suggest a trench being filled with a conductive material that includes a silicon epitaxial layer. Accordingly, the combination of the Applicant's Prior Art Drawings, Geissler *et al.*, Hsu *et al.* and Adan, *et al.* fails to teach or suggest the inventions set forth in the amended claims. Accordingly, reconsideration of the rejection of claim 2 under 35 U.S.C. § 103(a) is respectfully requested.

With regard to claim 3, Hashimoto, *et al.* also fail to teach or suggest the body contact set forth in the amended claims. Hashimoto, *et al.* also fail to teach or suggest the oxide region set forth in the amended claims. It is noted that the Examiner, in the rejection of claim 3, refers to Hashimoto *et al.* as teaching "layers of metal, tungsten and silicon epitaxial" at column 3 lines 18-34. However, a review of the Hashimoto *et al.* reference shows that what is taught by the reference is a trench groove formed in an epitaxial layer 3, the trench being filled with a metal such as tungsten (see column 3 lines 18-25). In Hashimoto, *et al.* there is no teaching or suggestion of a trench being filled with a conductive material that includes a silicon epitaxial layer. Therefore, the combination of the Applicant's Prior Art Drawings, Geissler *et al.*, Hsu *et al.* and Hashimoto, *et al.* fails to teach or suggest the inventions set forth in the amended claims. Accordingly, reconsideration of the rejection of claim 3 under 35 U.S.C. § 103(a) is respectfully requested.

With regard to claim 5, Lynch, *et al.* also fail to teach or suggest the body contact set forth in the amended claims. Lynch, *et al.* also fail to teach or suggest the body contact set forth in the amended claims. Lynch, *et al.* also fail to teach or suggest a trench being filled with a conductive material that includes a silicon epitaxial layer. Accordingly, the combination of the Applicant's Prior Art Drawings, Geissler *et al.*, Hsu *et al.* and Lynch, *et al.* fails to teach or suggest the inventions set forth in the amended claims. Accordingly, reconsideration of the rejection of claim 5 under 35 U.S.C. § 103(a) is respectfully requested.

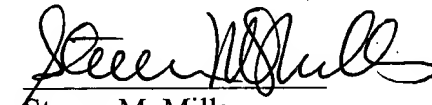
Applicant(s): Sung-bae Park, *et al.*
Serial No.: 09/924,787

With regard to claim 6, Lynch, *et al.* and Abiko, *et al.* fail to teach or suggest the body contact set forth in the amended claims. Lynch, *et al.* and Abiko, *et al.* fail to teach or suggest the oxide region set forth in the amended claims. Lynch, *et al.* and Abiko, *et al.* also fail to teach or suggest a trench being filled with a conductive material that includes a silicon epitaxial layer. Accordingly, the combination of the Applicant's Prior Art Drawings, Geissler *et al.*, Hsu *et al.* Lynch, *et al.* and Abiko, *et al.* fails to teach or suggest the inventions set forth in the amended claims. Accordingly, reconsideration of the rejection of claim 6 under 35 U.S.C. § 103(a) is respectfully requested.

In view of the amendments to the claims and the foregoing remarks, it is believed that, upon entry of this Amendment, all claims pending in the application will be in condition for allowance. Therefore, it is requested that this Amendment be entered and that the case be allowed and passed to issue. If a telephone conference will expedite prosecution of the application, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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